IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants:	Daniel N. CRIPE et al.	§	Confirmation No.:	8712
Serial No.:	10/717,730	§	Group Art Unit:	2616
Filed:	11/20/2003	§	Examiner:	P. Sinkantarakorn
For:	Method And System Of Teamed Network Adapters With Offloaded Connections	§	Docket No.:	200313587-1

APPEAL BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Date: February 29, 2008

Sir:

Appellants hereby submit this Appeal Brief in connection with the above-identified application. A Notice of Appeal was electronically filed on January 21, 2008.

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I. REAL PARTY IN INTEREST

The real party in interest is the Hewlett-Packard Development Company, L.P. (HPDC), a Texas Limited Partnership, having its principal place of business in Houston, Texas. HPDC is a wholly owned affiliate of Hewlett-Packard Company (HPC). The Assignment from the inventors to HPDC was recorded on November 20, 2003 at Reel/Frame 014724/0976.

II. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals or interferences.

III. STATUS OF THE CLAIMS

Originally filed claims:	1-21.
Claim cancellations:	None.
Added claims:	None.
Presently pending claims:	1-21.
Presently appealed claims:	1-21.

IV. STATUS OF AMENDMENT

Appellants have not filed any amendments after the Final Office Action dated December 14, 2007.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Various embodiments of the invention are described below. The scope of disclosure is not limited by the descriptions of the embodiments that follow. Citations to the specification have been provided to demonstrate where support may be found in the specification for various parts of the invention. Additional support may be found elsewhere in the application.

Appellants' contribution is directed to a technique for offloading and reloading network connections among multiple Network Interface Cards (NICs) 118, 120, 122 that have been teamed together. Specifically, a server 102 may communicate with one or more clients 104, 106 via a network switch 124. P. 3, ll. 21-23; Figure 1. The server 102 communicates with the network switch 124 using a plurality of NICs 118, 120, 122. P. 4, ll. 1-2; Figure 1. Processing of a TCP/IP stack 114 (used to establish and maintain network connections) in the server 102 is performed by a CPU 108, but may be "offloaded" (or "moved") to circuit logic in one of the NICs 118, 120, 122. P. 5, l. 31 – p. 6, l. 5; Figures 1-2. When NICs are operating in a team, they share common addresses. P. 6, ll. 22-24; Figure 1. Thus, packets received by the team may be received by any one of the NICs in the team. P. 3, ll. 30-31; Figure 1. When a NIC in the team becomes inoperative (*e.g.*, due to failure), another NIC in the team may receive the packet. P. 8, ll. 4-8; Figure 1. The technique mentioned above comprises detecting the receipt of a packet on a different-than-usual NIC and, as a result, offloading a network connection from the defective NIC to the NIC on which the packet was received. P. 9, ll. 8-16; Figures 1 and 4. Clearly, therefore, this offloading from the defective NIC to the NIC on which the packet was received **is precipitated by the receipt of the packet on that non-defective NIC**.

Claim 1 is directed to a computer system 100 that comprises a central processing unit (CPU) 108 and first and second network adapters 118, 120, 122 teamed together and configured to receive offloaded connections. P. 5, l. 31 – p. 6, l. 5; p. 6, ll. 22-24; Figure 1. A program 116 executing on the CPU 108 reloads an offloaded connection established by the first network adapter 118, 120, 122 onto the second network adapter 118, 120, 122 as a result of one of a

plurality of packets associated with the offloaded connection being received on the second network adapter 118, 120, 122. P. 9, ll. 8-16; Figures 1 and 4.

Claim 8 is directed to a method that comprises examining a packet received from an external device 124 and determining whether a connection associated with the packet is currently offloaded. Col. 8, l. 29 – col. 9, l. 3; Figures 1 and 4. The method also comprises reloading the connection in response to the packet associated with the connection being offloaded and received by a network interface 118, 120, 122 not currently processing the offloaded connection. P. 9, ll. 8-16; Figures 1 and 4.

Claim 12 is directed to a computer readable media 110 storing instructions 116 executable by a computer system 100, and when executed the instructions implement a method that comprises examining a packet received from an external device 124 and determining whether a connection 118, 120, 122 associated with the packet is currently offloaded. Col. 8, l. 29 – col. 9, l. 3; Figures 1 and 4. The method also comprises reloading the connection as a result of the packet associated with the connection being offloaded and received by a network interface 118, 120, 122 not currently processing the offloaded connection. P. 9, ll. 8-16; Figures 1 and 4.

Claim 16 is directed to a computer system 100 comprising means (*e.g.*, CPU 108; Figure 1) for reading and executing programs. Figure 1. The system 100 also comprises first and second means (*e.g.*, NICs 118, 120, 122; Figure 1) for sending and receiving data connections over a network, where the first and second means are grouped together and are capable of processing offloaded data connections. P. 3, ll. 21-23; p. 5, l. 31 – p. 6, l. 5; Figure 1. A program executed by the means for reading and executing programs reloads an offloaded connection established by the first means for sending and receiving data onto the second means for sending and receiving data in response to one of a plurality of packets associated with the offloaded connection being received on the second means for sending and receiving data. P. 9, ll. 8-16; Figures 1 and 4.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether under 35 U.S.C. § 103(a) claims 1-4 and 7-20 are obvious in view of Congdon (U.S. Pat. No. 6,151,297) and Siu (U.S. Pat. No. 7,072, 345).

Whether under 35 U.S.C. § 103(a) claims 5-6 and 21 are obvious in view of Congdon, Siu and Mahalingham (U.S. Pat. No. 6,314,525).

VII. ARGUMENT

A. Summary of Siu

The relevant portion of Siu cited by the Examiner (col. 8, ll. 23-44 and, in particular, col. 8, ll. 39-44) is directed to fault tolerance. Col. 8, l. 23. Col. 8, ll. 23-31 of Siu disclose fault tolerance in a switch. Referring to Fig. 11 of Siu, there is shown a line card 1102a that can be configured to include contacts to the input port card 1100a. The line card 1102a can also be configured to include contacts to an adjacent input port card. Siu teaches that if one set of these contacts fails, the line card transfers data cells to the secondary contact.

Col. 8, ll. 32-38 of Siu describe what happens when failure occurs in an intermediate layer 120 (see Fig. 8 of Siu). Siu teaches that in such a case, the input queues in the input circuits can be reduced and the failed intermediate layer circuit can be avoided. Siu also discloses that a reduction in the available intermediate layer circuits can be handled "gracefully" by reducing the input queue depth by one "on-the-fly" such that there is no interruption in packet processing.

Finally, col. 8, ll. 39-44 of Siu describe what happens when failure occurs in the outer layer (see Fig. 8 of Siu). Siu teaches that in such a case, the output port can be flagged as disabled. Siu teaches that the cells are routed to a different output port and that the router adjusts its routing functions to accommodate the failure.

B. Rejection Under 35 U.S.C. § 103(a) in View of Congdon and Siu

1. Claims 1-4 and 7-20

The Examiner rejected claims 1-4 and 7-20 under 35 U.S.C. § 103(a) as obvious in view of Congdon and Siu. Appellants traverse this rejection. Independent claim 1 is representative of this grouping of claims. Independent claim 1 requires "wherein a program executing on the CPU reloads an offloaded connection established by the first network adapter onto the second network adapter **as a result of** one of a plurality of packets associated with the offloaded connection being received on the second network adapter" (emphasis added).

The Examiner admits on p. 3 that Congdon fails to disclose this limitation and, as a result, the Examiner turns to Siu. In the Response to Arguments section of the Final Office Action dated December 14, 2007, the Examiner asserts that Siu, col. 8, ll. 39-44 disclose this limitation. The Examiner is mistaken. As explained above under subsection A, this portion of Siu merely teaches that when there is a failure in the output circuit, 1) the output port is flagged as disabled, 2) the cells are routed to a different output port, and 3) the router adjusts its routing functions to accommodate the failure. Siu makes absolutely no mention of reloading an offloaded connection to a network adapter **as a result of** that network adapter receiving a network packet, as required by claim 1.

> In the Final Office Action, p. 8, the Examiner argues that
>
> > Siu clearly teaches that when one of the ports fails, the cells are routed to a different output port. Once the cells are received at the different output port, the router adjusts its routing functions to reload the cells onto the different output port, which reads on the claim limitation "reloading as a result of one of a plurality of packets associated with the offloaded connection being received on the second network adapter."

Appellants submit that the Examiner is attributing to Siu teachings that are not found in Siu. Appellants agree that here, Siu teaches the failure of a port, the routing of cells to a different port, and the adjustment of the router's routing functions to reload the cells onto the different port. However, it appears that the Examiner is mischaracterizing Siu's teachings as anticipating claim 1. The Examiner appears to do this by stating that the foregoing actions occur "once received at the different port," thereby insinuating that the adjustment of routing functions occurs **as a result of** the receipt of packets onto the "different port." A simple reading of this portion of Siu corroborates Appellants' argument – the adjustment of routing functions in Siu is **not** taught to be **a result** of the receipt of packets on its "different port." Stated otherwise, while in claim 1 the receipt of a packet on the second network adapter is the triggering mechanism that causes the re-loading of the offloaded connection to the second network adapter, Siu simply teaches that there is a reconfiguration – Siu does not teach that this reconfiguration is precipitated by the receipt of packets on its "different port."

This distinction is significant at least because it pertains to how Appellants' contribution achieves one of its objectives. Specifically, referring to Fig. 1 of Appellants' application, when one of the NICs 118, 120, 122 fails or otherwise becomes inactive, another NIC with which the failed NIC is teamed may begin receiving packets from the network switch 124 that would otherwise have been received by the failed NIC. P. 7, ll. 5-6. This may occur because network switch 124 has detected failure of the failed NIC and has re-routed its packets to go to another NIC in the same team as the failed NIC. P. 7, ll. 5-6. In order for the NICs to continue operating as a team, the server 102 detects the NIC on which the packets (packets that would originally have gone to the failed NIC) are received. P. 8, l. 9 – p. 9, l. 16; Figures 1 and 4. The server 102 re-loads or offloads the connection of the failed NIC to the NIC on which these packets were received. P. 8, l. 9 – p. 9, l. 16; Figures 1 and 4. Thus, the limitation "wherein a program executing on the CPU reloads an offloaded connection established by the first network adapter onto the second network adapter **as a result of** one of a plurality of packets associated with the offloaded connection being received on the second network adapter" (claim 1; emphasis added) is significant at least because it pertains directly to how the server 102 achieves its objective.

Based on the foregoing, the Examiner erred in rejecting claims 1-4 and 7-20. Appellants request that the claims in this grouping be set for issue.

2. Additional Arguments for Dependent Claims 2 and 17

The Examiner erred in rejecting dependent claims 2 and 17 for an additional reason. Claim 2 is representative of this grouping of claims. Specifically, claim 2 requires "wherein the first and second network adapters are capable of fully offloading all protocol processing." The Examiner asserts that Congdon discloses this limitation in col. 6, ll. 34-38. The Examiner is mistaken. This portion of Congdon merely discloses that switches make switching decisions based upon the destination addresses of packets, that each NIC uses the same MAC address for the network interface, that the MAC interface is the interface between the NIC and the associated computer, and that the MAC implements a protocol which attaches the computer to the network. There is simply no mention

of first and second network adapters that are capable of "fully offloading all protocol processing," as required by claim 2. Siu fails to satisfy the deficiencies of Congdon. The Examiner erred in rejecting claims 2 and 17 for this additional reason. Thus, Appellants request that the claims in this grouping be set for issue.

3. Additional Arguments for Dependent Claims 4, 10, 14 and 19

The Examiner erred in rejecting dependent claims 4, 10, 14, 19 for an additional reason. Claim 4 is representative of this grouping of claims. Specifically, claim 4 requires "wherein the program reloads an offloaded connection by transferring the context of the connection from the first network adapter to the second network adapter." The Examiner asserts that Congdon teaches this limitation at col. 8, ll. 26-39. The Examiner is mistaken. This portion of Congdon discloses a fault tolerance feature in reference to Fig. 5. However, a mere fault tolerance feature does not automatically entail the transfer of context from a first network adapter to a second network adapter, as required by claim 4. Because Congdon fails to explicitly, inherently or even implicitly disclose the transfer of context as required by claim 4, and because Siu fails to satisfy the deficiencies of Congdon, the Examiner erred in rejecting claim 4. Thus, Appellants request that the claims in this grouping be set for issue.

C. Rejection Under 35 U.S.C. § 103(a) in View of Congdon, Siu and Mahalingham

1. Claims 5-6 and 21

The Examiner rejected claims 5-6 and 21 under 35 U.S.C. § 103(a) as obvious in view of Congdon, Siu and Mahalingham. Appellants traverse this rejection. As explained above in reference to independent claims 1 and 16, the Examiner erred in rejecting dependent claims 5-6 and 21 using the hypothetical combination of Congdon and Siu. Mahalingham fails to satisfy the deficiencies of Congdon and Siu, so the Examiner erred in rejecting dependent claims 5-6 and 21 in view of Congdon, Siu and Mahalingham.

2. Additional Arguments for Dependent Claims 6 and 21

The Examiner erred in rejecting dependent claims 6 and 21 for another reason. Claim 6 is representative of this grouping of claims. Specifically, claim 6 requires "wherein the first and second network adapters send a notification to the program if a connection is prematurely terminated." The Examiner admits that Congdon and Siu fail to teach this limitation, but asserts that Mahalingham discloses this limitation at col. 9, ll. 46-56. The Examiner is mistaken. As explained above in reference to dependent claim 5, this portion of Mahalingham does discuss the deactivation and the "marking as dead" of NICs, but there is simply no mention of the transmission of a notification to any program if a connection is prematurely terminated, as required by claim 6. The Examiner erred in rejecting dependent claim 6 for this additional reason. Thus, Appellants request that this grouping of claims be set for issue.

D. Conclusion

For the reasons stated above, Appellants respectfully submit that the Examiner erred in rejecting all pending claims. It is believed that no extensions of time or fees are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required (including fees for net addition of claims) are hereby authorized to be charged to Hewlett-Packard Development Company's Deposit Account No. 08-2025.

Respectfully submitted,

/Nick P. Patel/

Nick P. Patel
PTO Reg. No. 57,365
CONLEY ROSE, P.C.
(713) 238-8000 (Phone)
(713) 238-8008 (Fax)
AGENT FOR APPELLANTS

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
Legal Dept., M/S 35
P.O. Box 272400
Fort Collins, CO 80527-2400

VII. CLAIMS APPENDIX

1. (Previously presented) A computer system comprising:

a central processing unit (CPU); and

a first and second network adapter teamed together and configured to receive offloaded connections;

wherein a program executing on the CPU reloads an offloaded connection established by the first network adapter onto the second network adapter as a result of one of a plurality of packets associated with the offloaded connection being received on the second network adapter.

2. (Original) The system of claim 1 wherein the first and second network adapters are capable of fully offloading all protocol processing.

3. (Original) The system of claim 1 wherein the first and second network adapters transmit and receive packets of data using a single media access control (MAC) and internet protocol (IP) address.

4. (Original) The system of claim 1 wherein the program reloads an offloaded connection by transferring the context of the connection from the first network adapter to the second network adapter.

5. (Original) The system of claim 1 wherein the program monitors every packet received by the first and second network adapters and inactivates connections associated with packets that have not been received for a defined time period.

6. (Original) The system of claim 1 wherein the first and second network adapters send a notification to the program if a connection is prematurely terminated.

7. (Original) The system of claim 1 wherein the first and second network adapters comprise network interface cards (NICs).

8. (Previously presented) A method comprising:
examining a packet received from an external device;
determining whether a connection associated with the packet is currently offloaded; and
reloading the connection in response to the packet associated with the connection being offloaded and received by a network interface not currently processing the offloaded connection.

9. (Original) The method of claim 8 further comprising determining an identifier for the network interface that receives the packet and writing the determined identifier to a memory.

10. (Original) The method of claim 8 wherein the reloading further comprises copying the context of the connection to the network interface that received the packet.

11. (Original) The method of claim 8 wherein the network interface that received the packet and the network interface currently offloading the connection are teamed together.

12. (Previously presented) A computer readable media storing instructions executable by a computer system, and when executed the instructions implement a method comprising:
examining a packet received from an external device;
determining whether a connection associated with the packet is currently offloaded; and

reloading the connection as a result of the packet associated with the connection being offloaded and received by a network interface not currently processing the offloaded connection.

13. (Original) The computer readable media of claim 12 further comprising determining an identifier for the network interface that receives the packet and writing the determined identifier to a memory unit.

14. (Original) The computer readable media of claim 12 wherein the reloading further comprises copying the context of the connection to the network interface that received the packet.

15. (Original) The computer readable media of claim 12 wherein the network interface that received the packet and the network interface currently offloading the connection are teamed together.

16. (Previously presented) A computer system comprising:

means for reading and executing programs; and

first and second means for sending and receiving data connections over a network, the first and second means grouped together and capable of processing offloaded data connections;

wherein a program executed by the means for reading and executing programs reloads an offloaded connection established by the first means for sending and receiving data onto the second means for sending and receiving data in response to one of a plurality of packets associated with the offloaded connection being received on the second means for sending and receiving data.

17. (Original) The system of claim 16 wherein the first and second means for sending and receiving data connections are capable of fully offloading all protocol processing.

18. (Original) The system of claim 16 wherein the first and second means for sending and receiving data connections send and receive packets of data using a single media access control (MAC) and internet protocol (IP) address.

19. (Original) The system of claim 16 wherein the program reloads an offloaded connection by transferring the context of the connection from the first means for sending and receiving data connections to the second means for sending and receiving data connections.

20. (Original) The system of claim 16 wherein the program monitors all data received by the first and second means for sending and receiving data connections.

21. (Original) The system of claim 16 wherein the first and second means for sending and receiving data connections send a notification to the program if a connection is prematurely terminated.

VIII. EVIDENCE APPENDIX

None.

IX. RELATED PROCEEDINGS APPENDIX

None.